

- 27 -

CLAIMS

1) Water dispersible or water soluble porous bodies
5 comprising a three dimensional open-cell lattice
containing:

(a) less than 10% by weight of water-soluble polymeric
material other than a surfactant, and

10 (b) 5 to 95% by weight of a surfactant, said porous
bodies having an intrusion volume as measured by
mercury porosimetry (as hereinafter described) of
at least about 3 ml/g

15 2) Porous bodies as claimed in claim 1 wherein the bodies
are in the form of powders, beads or moulded bodies

20 3) Porous bodies as claimed in claim 1 or claim 2 wherein
the polymeric material is a natural gum, a
polysaccharide, a cellulose derivative or a homopolymer
or copolymer comprising (co)monomers selected from:-

vinyl alcohol,

acrylic acid,

25 methacrylic acid

acrylamide,

methacrylamide

acrylamide methylpropane sulphonates

aminoalkylacrylates

30 aminoalkylmethacrylates

hydroxyethylacrylate

- 28 -

hydroxyethylmethacrylate

vinyl pyrrolidone

vinyl imidazole

vinyl amines

5 vinyl pyridine

ethyleneglycol

ethylene oxide

ethyleneimine

styrenesulphonates

10 ethyleneglycolacrylates

ethyleneglycol methacrylate

- 4) Porous bodies as claimed in claim 3 wherein the cellulose derivative is selected from xanthan gum,
15 xyloglucan, cellulose acetate, methylcellulose, methylethylcellulose, hydroxyethyl-cellulose, hydroxyethylmethylethylcellulose, hydroxypropylcellulose, hydroxypropylmethylethylcellulose (HPMC), hydroxypropylbutylcellulose,
20 ethylhydroxyethylcellulose, carboxymethylcellulose and its salts, or carboxymethyl-hydroxyethylcellulose and its salts

- 5) Porous bodies as claimed in any preceding claim wherein
25 the surfactant is non-ionic, anionic, cationic, or zwitterionic

- 6) Porous bodies as claimed in any preceding claim wherein the surfactant is solid at ambient temperature

- 29 -

- 7) Porous bodies as claimed in any preceding claim wherein the surfactant is selected from ethoxylated triglycerides; fatty alcohol ethoxylates; alkylphenol ethoxylates; fatty acid ethoxylates; fatty amide ethoxylates; fatty amine ethoxylates; sorbitan alkanoates; ethylated sorbitan alkanoates; alkyl ethoxylates; pluronics; alkyl polyglucosides; stearyl ethoxylates; alkyl polyglycosides; alkylether sulfates; alkylether carboxylates; alkylbenzene sulfonates; alkylether phosphates; dialkyl sulfosuccinates; alkyl sulfonates; soaps; alkyl sulfates; alkyl carboxylates; alkyl phosphates; paraffin sulfonates; secondary n-alkane sulfonates; alpha-olefin sulfonates; isethionate sulfonates; fatty amine salts; fatty diamine salts; quaternary ammonium compounds; phosphonium surfactants; sulfonium surfactants; sulfonxonium surfactants; N-alkyl derivatives of amino acids (such as glycine, betaine, aminopropionic acid); imidazoline surfactants; amine oxides; amidobetaines; and mixtures thereof
- 8) Porous bodies as claimed in any preceding claim wherein the porous polymeric bodies have water soluble or water insoluble materials incorporated into the polymeric lattice
- 9) Water soluble porous polymeric bodies as claimed in claim 8 wherein the water soluble material is selected from water soluble vitamins; water soluble fluorescers; activated aluminium chlorohydrate; transition metal complexes used as bleaching catalysts; water soluble polymers; diethylenetriaminepentaacetic acid (DTPA);

- 30 -

primary and secondary alcohol sulphates containing greater than C8 chain length or mixtures thereof

- 10) Water soluble porous polymeric bodies as claimed in
claim 8 wherein the water insoluble material is
selected from antimicrobial agents; antidandruff agent;
skin lightening agents; fluorescing agents; antifoams;
hair conditioning agents; fabric conditioning agents;
skin conditioning agents; dyes; UV protecting agents;
bleach or bleach precursors; antioxidants;
insecticides; pesticides; herbicides; perfumes or
precursors thereto; flavourings or precursors thereto;
pharmaceutically active materials; hydrophobic
polymeric materials and mixtures thereof.

- 11) A method for preparing water dispersible or water
soluble porous bodies comprising a three dimensional
open-cell lattice containing

(a) less than 10% by weight of a water soluble
polymeric material and

(b) 5 to 90% by weight of a surfactant, said porous
bodies having an intrusion volume as measured by
mercury porosimetry (as hereinafter described) of
at least about 3 ml/g with the proviso that said
porous bodies are not spherical beads having an
average bead diameter of 0.2 to 5mm

comprising the steps of:

- 31 -

- a) providing an intimate mixture of the polymeric material and the surfactant in a liquid medium
- b) providing a fluid freezing medium at a temperature effective for rapidly freezing the liquid medium;
- c) cooling the liquid medium with the fluid freezing medium at a temperature below the freezing point of the liquid medium for a period effective to rapidly freeze the liquid medium; and
- d) freeze-drying the frozen liquid medium to form the porous bodies by removal of the liquid medium by sublimation.

12) A method as claimed in claim 11 wherein the cooling of the liquid medium is accomplished by spraying an atomised emulsion into the fluid freezing medium; by dropping drops of the emulsion into the fluid freezing medium or by pouring the emulsion into a mould and cooling the emulsion in the mould.

13) A method as claimed in claim 11 or 12 wherein the polymeric material is a natural gum, a polysaccharide, a cellulose derivative or a homopolymer or copolymer comprising (co)monomers selected from:-

vinyl alcohol,
acrylic acid,
methacrylic acid
acrylamide,

- 32 -

- methacrylamide
acrylamide methylpropane sulphonates
aminoalkylacrylates
aminoalkylmethacrylates
5 hydroxyethylacrylate
hydroxyethylmethacrylate
vinyl pyrrolidone
vinyl imidazole
vinyl amines
10 vinyl pyridine
ethyleneglycol
ethylene oxide
ethyleneimine
styrenesulphonates
15 ethyleneglycolacrylates
ethyleneglycol methacrylate
- 14) A method as claimed in any one of claims 11 to 13
wherein the surfactant is non-ionic, anionic, cationic,
20 or zwitterionic
- 15) A method as claimed in any one of claims 11 to 14
wherein the surfactant is solid at ambient temperature
- 25 16) A method as claimed in any one of claims 11 to
15 wherein the surfactant has an HLB value of 8 to 18
- 17) A method as claimed in any one of claims 11 to 16
wherein the surfactant is selected from ethoxylated
30 triglycerides; fatty alcohol ethoxylates; alkylphenol
ethoxylates; fatty acid ethoxylates; fatty amide

- 33 -

ethoxylates; fatty amine ethoxylates; sorbitan
alkanoates; ethylated sorbitan alkanoates; alkyl
ethoxylates; pluronics; alkyl polyglucosides; stearyl
ethoxylates; alkyl polyglycosides; alkylether sulfates;
5 alkylether carboxylates; alkylbenzene sulfonates;
alkylether phosphates; dialkyl sulfosuccinates; alkyl
sulfonates; soaps; alkyl sulfates; alkyl carboxylates;
alkyl phosphates; paraffin sulfonates; secondary n-
alkane sulfonates; alpha-olefin sulfonates; isethionate
10 sulfonates; fatty amine salts; fatty diamine salts;
quaternary ammonium compounds; phosphonium surfactants;
sulfonium surfactants; sulfonxonium surfactants; N-
alkyl derivatives of amino acids (such as glycine,
betaine, aminopropionic acid); imidazoline surfactants;
15 amine oxides; amidobetaines; and mixtures thereof

18) A method as claimed in claim 11 wherein the intimate
mixture is an oil-in-water emulsion

20 19) A method as claimed in claim 18 wherein the
discontinuous phase of the emulsion comprises 10 to
95% by volume of the emulsion

25 20) A method as claimed in claim 18 wherein the
discontinuous phase of the emulsion comprises 20 to
60% by volume of the emulsion

30 21) A method as claimed in claim 18 wherein the
discontinuous phase of the emulsion is selected from
alkanes; cyclic hydrocarbons; halogenated alkanes;

- 34 -

esters; ketones; ethers; volatile cyclic silicones and mixtures thereof

22) Solutions or dispersions comprising water soluble
5 polymeric materials and surfactant formed by exposing the porous bodies of any one of claims 1 to 10 to an aqueous medium.

23) Solutions or dispersions comprising water soluble
10 polymeric materials, surfactant and a hydrophobic material formed by exposing the porous bodies of claim 8 having the hydrophobic material contained therein to an aqueous medium.

15